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best brief texts in English that are available for elementary students. Its issue by an American house will make it much more accessible for American students.—C. R. B.

### MINOR NOTICES

**The vegetation of Texas.**—BRAY<sup>4</sup> has made a presentation in a most attractive booklet of the various ecological features of the Texas vegetation. The style of the work is popular, inasmuch as the design of the author was to make the general features of the vegetation of the state a matter of interest to students in the schools and citizens generally. First the factors of plant environment are considered, detailed application being made to the familiar plants of the state. Next follows an account of the plant societies, treated chiefly after the order of SCHIMPER. It is here especially that one may see the astonishing variety that is to be found in Texas. The woodlands range from the fine bottomland and pine forests of the southeast, through post-oak or live-oak forests to the western chaparral. Again in the mountains the characteristic conifer forests of the Rocky Mountains are to be found. There are also extensive areas of prairie and desert. Last of all is considered the vegetation of the water, halophytic areas, and dunes. It is probable that somewhere in Texas any citizen of the entire country (except the far west) could find familiar plant formations, so great is the variety. It is to be hoped that this most excellent work will be made of great use throughout the state. For the purpose it is probably the best work that any of our states possesses. There are some good maps, and a number of photographic representations of characteristic landscapes and vegetation types.—HENRY C. COWLES.

**Ecological exploration in northern Michigan.**—Few have recently done more to advance the frontier lines of ecology than has C. C. ADAMS,<sup>5</sup> and it may be said that his report on the survey of parts of northern Michigan is the record of essentially pioneer work. This is probably the first paper to extend the principles of physiographic ecology to the biota of a region. It is obvious that the future must see much work of this character, for it is only by such studies as this, carried on by a number of ecological specialists, that the complex interrelations of any biota are to be worked out. There are three special ecological papers in this report. A. G. RUTHVEN, who had charge of the field-work, under the supervision of Mr. ADAMS, presents an account of the regions studied, the Porcupine Mountains and Isle Royale. The chief feature here is the detailed description of the representative stations that were chosen for study. In each case the characteristic plants and animals are noted, and the physiographic and ecological dynamics are elucidated. Papers follow on the ecological distribution of the birds of the

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<sup>4</sup> BRAY, W. L., *Distribution and adaptation of the vegetation of Texas*. Bull. Univ. Tex. 82; Scientific Series 10. pp. 108. Austin. 1906.

<sup>5</sup> ADAMS, CHARLES C., *An ecological survey in northern Michigan*. From report of Michigan State Board of Geological Survey for 1905. pp. 133. Lansing. 1906.

Porcupine Mountains, by OTTO MCCREARY; and on the ecological relations of the Porcupine Mountain Orthoptera, by A. P. MORSE. The report is concluded by a number of annotated lists.—HENRY C. COWLES.

### NOTES FOR STUDENTS

**A botanical survey of New Zealand.**—We are constantly reminded of the remarkable vegetation of this far away-land through the indomitable energy of COCKAYNE,<sup>6</sup> whose ecological studies are always of the highest value. The island whose flora is here considered is one of the three that been has long set apart as a preserve through the commendable foresight of the New Zealand government. Perhaps the most interesting formation of the island is the forest, made up of a number of the characteristic New Zealand trees, whose distribution is related to wind in a most striking way. The heaths, the scrub, the strand, etc., are more briefly described, and then follows an interesting chapter on the affinities of the flora. The paper is accompanied with representative formation photographs, and a list of the species with Latin, English, and Maori names. The New Zealand government, which has made possible COCKAYNE's study of the island, and which has published this valuable report, is to be most heartily congratulated for its good sense. It is to hoped that the government will find a way to employ COCKAYNE's services for similar work all over the country, and especially because he is the man best fitted for this work. This is an admirable undertaking for any government, and particularly for New Zealand, since its flora is without counterpart elsewhere, and seems to be more than commonly subject to destruction by the ravages of man.—HENRY C. COWLES.

**Alpine flora of Argentina.**—R. E. FRIES<sup>7</sup> has given an account of some interesting Argentine plant formations, chiefly in the northwest Cordilleran region. The region as a whole is very xerophytic, and the most striking plant formation of another type is the Hypsela formation, which is found along the stream courses, reminding one in a small way of the forest belts along streams in our prairie districts. The chief non-halophytic desert formations are the Hoffmanseggia, cactus, and Azorella formations. All are characterized by a dominance of xerophytic shrubs, but the Hoffmanseggia formation is the characteristic formation of the sandy plateaux, while the cacti dominate more on the stony hills. The Azorella formation is on the higher hills and is closely related to the cactus formation. Above the Azorella are lichen deserts. There are also regions of dunes some of which are dominated by Patagonium, others by Lampaya. Halophytic areas are extensive, some being dominated by *Salicornia pulvinata*, others by *Sporobolus arundinaceus*, and still others are shrubby areas with a dominance of

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<sup>6</sup> COCKAYNE, L., Report on a botanical survey of Kapiti Island. pp. 23. Wellington. 1907.

<sup>7</sup> FRIES, R. E., Zur Kenntniss des alpinen Flora im nördlichen Argentinien. Nov. Act. Reg. Soc. Sci. Upsal. IV. 1:1-205. 1905.